



Patent Technology Centers

Facsimile Transmission

To:	Name:	Ronald J. Kubovcik (25,401)
	Company:	Kubovcik & Kubovcik
	Fax Number:	703-412-9345
	Voice Phone:	703-412-9494
From:	Name:	Michael J. Feely
	Official Fax Number:	(571) 273-8300
	Official After Final Fax Number:	(571) 273-8300
	Voice Phone:	571-272-1086

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Fax Notes:

Mr. Kubovcik,

The following is a proposed amendment to put 10/590,442 in condition for allowance. Attached are: a marked-up proposal, a clean proposal, and comments discussing the rationale for these changes. The changes primarily address wording/clarity issues. If acceptable, I will enter these changes in an examiner's amendment.

Sincerely,

Michael J Feely (Primary Examiner; AU 1761)

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Marked-up Version

In the claims:

1. (Proposed Amendment) An epoxy resin composition for carbon-fiber-reinforced composite materials, comprising the following components [A], [B], [C], [D] and [E]:

[A] epoxy resin,

[B] amine curing agent which is dicyandiamide,

[C] phosphorus compound,

[D] curing accelerator which is 1,1'-(4-methyl-m-phenylene)bis(3,3-dimethylurea) and,

[E] [[a]] thermoplastic resin;

wherein ~~the concentration of the~~ component [C] is present in an amount such that the resin composition has a phosphorus atom concentration of is 0.2 to 15% by weight ~~in terms of phosphorus atom concentration;~~ and

wherein ~~a content of~~ components [A], [B], [C], [D], and [E] are present in amounts such that the combined amount of components [A], [B], [C], [D], and [E] is at least in the epoxy resin composition is more than 95% by weight, based on the overall resin composition.

2. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, ~~characterized in that the~~ wherein the resin composition has a viscosity of the composition is 10 to 700 Pa's at 60°C.

3. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, ~~characterized by comprising red phosphorus as~~ the wherein component [C] comprises red phosphorus.

4. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 3, ~~characterized in that~~ wherein the red phosphorus is coated with a metal hydroxide, a resin or a combination thereof and/or a resin.

5-10. (canceled)

11. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, ~~characterized in that the~~ wherein the resin composition has a specific gravity of the composition is 1.35 or lower.

12. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, ~~characterized in that the composition can be~~ wherein the resin composition is capable of being cured within 30 minutes at 150°C.

13. (Previously Presented) A prepreg, prepared by impregnating carbon fiber with the epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1.

14. (Proposed Amendment) The prepreg according to claim 13, wherein the prepreg has a
~~characterized in that the~~ fiber volume content of a prepreg is 30 to 95%.

15. (Proposed Amendment) The prepreg according to claim 13, wherein the prepreg is a
woven prepreg or a unidirectional prepreg ~~A fiber reinforced composite sheet,~~
~~characterized by comprising a cured resin prepared by curing the epoxy resin~~
~~composition for carbon fiber reinforced composite materials according to claim 1; and~~
~~carbon fiber.~~

16. (Proposed Amendment) A fiber-reinforced composite material sheet, prepared by
laminating a plurality of prepregs according to claim 15 and curing said laminate a
prepreg according to claim 13.

17-49. (Proposed Cancellation)

50. (New) A fiber-reinforced composite material, prepared by curing the prepreg
according to claim 13.

In the specification:

- Replace the abstract with:
 - The present invention provides a light-weight fiber-reinforced composite material that has excellent flame retardance and mechanical properties and never emits a halogen gas. The present invention also provides a prepreg and ~~[[en]]~~ an epoxy resin composition

suited to obtain the above described fiber-reinforced composite material. The present invention also provides an integrated molding which is produced using the above described fiber-reinforced composite material, thereby suitable for use in electric/electronic casings. The epoxy resin composition is such that it contains the following components [A], [B], ~~and~~ [C], [D], and [E]:

[A] epoxy resin,

[B] amine curing agent, ~~and~~

[C] phosphorus compound,

[D] curing accelerator, and

[E] thermoplastic resin,

wherein the resin composition has a phosphorus atom concentration of ~~the component [C]~~ is 0.2 to 15% by weight ~~in terms of phosphorus atom concentration.~~--

Clean Version

In the claims:

1. (Proposed Amendment) An epoxy resin composition for carbon-fiber-reinforced composite materials, comprising the following components [A], [B], [C], [D] and [E]:

[A] epoxy resin,

[B] amine curing agent which is dicyandiamide,

[C] phosphorus compound,

[D] curing accelerator which is 1,1'-(4-methyl-m-phenylene)bis(3,3-dimethylurea) and,

[E] thermoplastic resin;

wherein component [C] is present in an amount such that the resin composition has a phosphorus atom concentration of 0.2 to 15% by weight; and

wherein components [A], [B], [C], [D], and [E] are present in amounts such that the combined amount of components [A], [B], [C], [D], and [E] is at least 95% by weight, based on the overall resin composition.

2. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, wherein the resin composition has a viscosity of 10 to 700 Pa's at 60°C.

3. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, wherein component [C] comprises red phosphorus.

4. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 3, wherein the red phosphorus is coated with a metal hydroxide, a resin or a combination thereof.

5-10. (canceled)

11. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, wherein the resin composition has a specific gravity of 1.35 or lower.

12. (Proposed Amendment) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, wherein the resin composition is capable of being cured within 30 minutes at 150°C.

13. (Previously Presented) A prepreg, prepared by impregnating carbon fiber with the epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1.

14. (Proposed Amendment) The prepreg according to claim 13, wherein the prepreg has a fiber volume content of 30 to 95%.

Proposed Amendment for: 10/590,442
(Attorney Docket No. HRK-001)

15. (Proposed Amendment) The prepreg according to claim 13, wherein the prepreg is a woven prepreg or a unidirectional prepreg.

16. (Proposed Amendment) A fiber-reinforced composite material, prepared by laminating a plurality of prepreps according to claim 15 and curing said laminate.

17-49. (Proposed Cancellation)

50. (New) A fiber-reinforced composite material, prepared by curing the prepreg according to claim 13.

In the specification:

- Replace the abstract with:
 - The present invention provides a light-weight fiber-reinforced composite material that has excellent flame retardance and mechanical properties and never emits a halogen gas. The present invention also provides a prepreg and an epoxy resin composition suited to obtain the above described fiber-reinforced composite material. The present invention also provides an integrated molding which is produced using the above described fiber-reinforced composite material, thereby suitable for use in electric/electronic casings. The epoxy resin composition is such that it contains the following components [A], [B], [C], [D], and [E]: [A] epoxy resin, [B] amine curing agent, [C] phosphorus compound, [D] curing accelerator, and [E] thermoplastic resin, wherein the resin composition has a phosphorus atom concentration of 0.2 to 15% by weight.--

Comments

- In claim 1, the phosphorus content limitation was amended to improve clarity.
Paragraph 0070 of the corresponding pre-publication was used for guidance.
- In claim 1, the [A-E] content limitation was amended to improve clarity.
Paragraph 0099 of the corresponding pre-publication was used for guidance.
- Claims 2-4, 11, 12, and 14 were amended to address minor wording issues. The changed were made to improve clarity.
- Claim 15 was amended to feature the prepreg limitations discussed in paragraphs 0107-0108 of the corresponding pre-publication.
- Claim 16 was amended to feature the composite material discussed in paragraphs 0107-0108 of the corresponding pre-publication.
- Claims 17-49 were cancelled because they were withdrawn without traverse.
- Claim 50 was added to feature the composite material discussed in paragraph 0115 of the corresponding pre-publication.
- The abstract was amended into a single-paragraph. It also better reflects the claimed subject matter.